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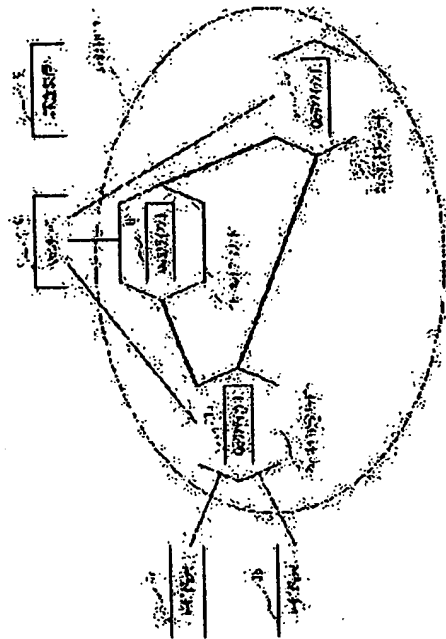
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(54) NETWORK SERVICE CLASS SETTING SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a network service class setting system that enables a user to freely select and designate the service conditions of a network service desired in use for every connection, when a user terminal connects with the network and can collect a charge depending on a service class on the service condition and communication quantity used by the user.

SOLUTION: In the network, in which network nodes each provided with a QoS client are interconnected by a communication network, each QoS client is connected to a QoS server, user terminals are connected to the QoS client. When the user terminal requests the network service, the QoS server informs the user terminal about the service conditions of the network service sent from the QoS server, and the user terminal selects the service condition and designates it to conduct the network service at the service class, corresponding to the selected and designated service conditions.



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CLAIMS

[Claim(s)]

[Claim 1] In the network where two or more network nodes were connected mutually in communication networks, such as the Internet Each of said network node is equipped with a QoS client, and said QoS client is connected to a QoS server. In case two or more user terminals are connected to said QoS client and said user terminal requires a network service By notifying the service conditions of the network service sent out from said QoS server to said user terminal, and choosing and specifying said service conditions from said user terminal The network class-of-service setting-out method characterized by performing a network service by the class of service according to said service conditions chosen and specified.

[Claim 2] The network class-of-service setting-out method according to claim 1 characterized by performing accounting to said user terminal according to the class of service of the traffic which accounting equipment was further connected to said QoS server, and said user terminal required for receiving a network service, and a network service.

[Claim 3] Said QoS server is equipped with a network information gathering means, a service unit rate means, and a traffic unit rate means. While said network information gathering means collects and manages the network information which said QoS client collects Said service unit rate means sets up the toll for every service unit of a network service based on said network information. Claim 1 characterized by said traffic unit rate means setting up the toll of the traffic unit of a network service based on said network information, or a network class-of-service setting-out method according to claim 2.

[Claim 4] Said QoS server is further equipped with a traffic collection means and an accounting means, and said traffic collection means receives the traffic of the user terminal which said QoS client collected, and sends it out to said accounting means. Said accounting means The traffic of said user terminal, The toll for every service unit of the network service which said service unit rate means set up, The network class-of-service setting-out method according to claim 3 characterized by performing accounting from the toll of the traffic unit of the network service which said traffic unit rate means set up to said user terminal.

[Claim 5] They are claim 3 characterized by what said service condition presentation means notifies the service conditions of a network service to said user terminal through said QoS client, and said user terminal to said service conditions are chosen when said QoS server is further equipped with a service condition presentation means and said user terminal requires a network service, and can be specified, or a network class-of-service setting-out method according to claim 4.

[Claim 6] It is the network class-of-service setting-out method according to claim 5 characterized by equipping said QoS server with a class-of-service expansion means further, setting up the quality of the network service according to the service conditions which said class-of-service expansion means chose said service conditions from said user terminal, and were specified as a class of service, and notifying said class of service to each of said QoS client.

[Claim 7] In case said user terminal requires a network service, the service conditions of the network service sent out from said service condition presentation means of said QoS server are notified to said

user terminal through said QoS client. By choosing and specifying said service conditions from said user terminal Said service condition presentation means receives said service conditions chosen and specified, and it notifies to said class-of-service expansion means. Said class-of-service expansion means sets up the class of service according to said service conditions chosen and specified, and notifies to each of said QoS client. Said QoS client is a network class-of-service setting-out method according to claim 6 characterized by performing a network service by said class of service.

[Claim 8] In case said user terminal requires a network service, the service conditions of the network service sent out from said service condition presentation means of said QoS server are notified to said user terminal through said QoS client. By choosing and specifying said service conditions from said user terminal Said service condition presentation means receives said service conditions chosen and specified, and it notifies to said class-of-service expansion means. Said class-of-service expansion means sets up the class of service according to said service conditions chosen and specified, and notifies to each of said QoS client. When said QoS client performs a network service by said class of service and the communication link of said user terminal is completed Said traffic collection means receives the traffic of said user terminal which said QoS client collected, and sends it out to said accounting means. Said accounting means The traffic of said user terminal, The toll for every service unit of the network service which said service unit rate means set up, The network class-of-service setting-out method according to claim 7 characterized by performing accounting from the toll of the traffic unit of the network service which said traffic unit rate means set up to said user terminal.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] A user specifies the service conditions of a network service to use at every connection, and especially this invention relates to the network class-of-service setting-out method which makes it possible to collect the toll of a network service according to the class of service and traffic according to the service condition, when connecting with a network from a user terminal about a network class-of-service setting-out method.

[0002]

[Description of the Prior Art] In recent years, the network service which used communication networks, such as the Internet, has spread explosively, and this network service is simultaneously used increasingly by many users.

[0003]

[Problem(s) to be Solved by the Invention] In the conventional network service mentioned above, when a user connects with a network, since connection conditions are the same among many users, a connect time becomes extremely late or it has troubles, such as becoming connection impossible according to generating of a time-out etc.

[0004] A user chooses freely the service conditions of a network service to use at every connection, and specifies them, and the object of this invention is to offer the network class-of-service setting-out method which makes it possible to collect the toll of a network service according to the traffic which the class of service according to the service condition and a user use, when connecting with a network from a user terminal.

[0005]

[Means for Solving the Problem] The network class-of-service setting-out method of this invention In the network where two or more network nodes were connected mutually in communication networks, such as the Internet Each of said network node is equipped with a QoS client, and said QoS client is connected to a QoS server. In case two or more user terminals are connected to said QoS client and said user terminal requires a network service By notifying the service conditions of the network service sent out from said QoS server to said user terminal, and choosing and specifying said service conditions from said user terminal It is characterized by performing a network service by the class of service according to said service conditions chosen and specified.

[0006] Moreover, accounting equipment is further connected to said QoS server, and it is characterized by performing accounting to said user terminal according to the class of service of the traffic which said user terminal required for receiving a network service, and a network service.

[0007] Furthermore, it is characterized by to equip said QoS server with a network information gathering means, a service unit rate means, and a traffic unit rate means, for said service unit rate means to set up the toll for every service unit of a network service based on said network information, while said network information gathering means collects and manages the network information which said QoS client collects, and for said traffic unit rate means to set up the toll of the traffic unit of a network

service based on said network information.

[0008] Moreover, said QoS server is further equipped with a traffic collection means and an accounting means. Said traffic collection means receives the traffic of the user terminal which said QoS client collected, and sends it out to said accounting means. Said accounting means The traffic of said user terminal, It is characterized by performing accounting from the toll for every service unit of the network service which said service unit rate means set up, and the toll of the traffic unit of the network service which said traffic unit rate means set up to said user terminal.

[0009] Furthermore, when said QoS server is further equipped with a service condition presentation means and said user terminal requires a network service, said service condition presentation means notifies the service conditions of a network service to said user terminal through said QoS client, and it is characterized by the ability to choose and specify said service conditions from said user terminal.

[0010] Moreover, said QoS server is further equipped with a class-of-service expansion means, the quality of the network service according to the service conditions which said class-of-service expansion means chose said service conditions from said user terminal, and were specified is set up as a class of service, and it is characterized by notifying said class of service to each of said QoS client.

[0011] Furthermore, in case said user terminal requires a network service, the service conditions of the network service sent out from said service condition presentation means of said QoS server are notified to said user terminal through said QoS client. By choosing and specifying said service conditions from said user terminal Said service condition presentation means receives said service conditions chosen and specified, and it notifies to said class-of-service expansion means. Said class-of-service expansion means sets up the class of service according to said service conditions chosen and specified, and notifies to each of said QoS client, and said QoS client is characterized by performing a network service by said class of service.

[0012] Moreover, in case said user terminal requires a network service, the service conditions of the network service sent out from said service condition presentation means of said QoS server are notified to said user terminal through said QoS client. By choosing and specifying said service conditions from said user terminal Said service condition presentation means receives said service conditions chosen and specified, and it notifies to said class-of-service expansion means. Said class-of-service expansion means sets up the class of service according to said service conditions chosen and specified, and notifies to each of said QoS client. When said QoS client performs a network service by said class of service and the communication link of said user terminal is completed Said traffic collection means receives the traffic of said user terminal which said QoS client collected, and sends it out to said accounting means. Said accounting means The traffic of said user terminal, It is characterized by performing accounting from the toll for every service unit of the network service which said service unit rate means set up, and the toll of the traffic unit of the network service which said traffic unit rate means set up to said user terminal.

[0013]

[Embodiment of the Invention] Next, the gestalt of operation of this invention is explained with reference to a drawing.

[0014] Drawing 1 is the block diagram showing 1 operation gestalt of the network class-of-service setting-out method of this invention.

[0015] Network node 2a equipped with QoS (Quality of Service: quality of service) client 1a which performs a network service and which is equipment, network node 2b equipped with QoS client 1b which performs a network service and which is equipment, and network node 2c equipped with QoS client 1c which performs a network service and which is equipment are connected mutually in communication networks, such as the Internet, and the gestalt of this operation shown in drawing 1 constitutes the network 3. Moreover, direct continuation of the QoS clients 1a, 1b, and 1c is carried out to the QoS server 4 which is the main unit which performs a network service in communication networks, such as the Internet, respectively. Furthermore, communication networks, such as the Internet, connect also with the user terminal 5 using a network service, respectively, and the QoS clients 1a, 1b, and 1c have illustrated the case where QoS client 1a is connected with user-terminal 5a and user-

terminal 5b, in drawing 1. Furthermore, the QoS server 4 is connected with the accounting equipment 6 which performs accounting to a user terminal in communication networks, such as the Internet.

[0016] Next, with reference to drawing 2, the detail configuration of the QoS server 4 and the QoS client 1 is explained.

[0017] Drawing 2 is the detail block diagram showing an example of a QoS server and a QoS client.

[0018] In addition, the thing corresponding to the component shown in drawing 1 in drawing 2 attaches the same reference figure or the same sign, and omits the explanation.

[0019] A network information gathering means 41 to collect all the network information to which the QoS client 1 collects the QoS servers 4 in drawing 2, A service unit rate means 42 to set a toll as the service unit of a network service based on network information, A traffic unit rate means 43 to set up the toll of the traffic unit of a network service based on network information, A traffic collection means 44 to collect the amounts of the communication link for which the user terminal 5 used the network service, An accounting means 45 to perform accounting from the traffic in a user terminal 5, and a service unit tariff to a user terminal 5, A service condition presentation means 46 to show a user terminal 5 the service conditions of the network service in case a user terminal 5 tends to use a network service, It has the class-of-service expansion means 47 for performing a network service on the service conditions which the user terminal 5 chose.

[0020] The network information gathering means 41 collects all the network information that the QoS client 1 collected as node information. This network information is the information on the network which the QoS client 1 collects every network node 2, for example, is the toll of the allowances band information for every network node, congestion information, post-dialing delay information, and a traffic unit, network class-of-service information, etc. An example of the network information which the network information gathering means 41 collected is shown in drawing 3.

[0021] The service unit rate means 42 sets up the toll of the service unit of a network service based on the network information which the network information gathering means 41 collected.

[0022] The traffic unit rate means 43 sets up the toll of the traffic unit of a network service based on the network information which the network information gathering means 41 collected.

[0023] The traffic collection means 44 collects the amount of the communication link for which each of a user terminal 5 used the network service, i.e., communication link time amount, and the communication link amounts of data through the QoS client 1.

[0024] The accounting means 45 performs accounting to each of a user terminal 5, and sends this out to accounting equipment 6. Accounting is performed from the traffic in the user terminal 5 which the traffic collection means 44 collected, and the toll of the traffic unit which the toll of a service unit and the traffic unit rate means 43 which the service unit rate means 42 set up set up. An example of accounting to a user terminal 5 is shown in drawing 4.

[0025] The service condition presentation means 46 shows a user terminal 5 the service conditions of the network service through the QoS client 1, in case a user terminal 5 tends to use a network service. Service conditions are connection conditions which the user using a user terminal 5 chooses, for example, are the bandwidth at the time of using a network service, a post-dialing delay permissible dose, a toll, etc.

[0026] The class-of-service expansion means 47 receives the connection conditions which the user chose from the service conditions which the service condition presentation means 46 presented to the user terminal 5, sets up the quality of a network service as a class of service based on this connection condition, and it notifies it to each QoS client 1 so that a network service may be performed in this class of service. The class of service is the same as that of the connection conditions which the user chose from the service conditions which the user terminal 5 described previously was shown.

[0027] A node information gathering means 11 by which the QoS client 1 in drawing 2 collects node information every network node 2, While sending out the service conditions which a traffic measurement means 12 to measure the amount of the communication link for which the user terminal 5 used the network service, and the service condition presentation means 46 of the QoS server 4 present to a user terminal 5 A service condition offer means 13 to send out the connection conditions which the

user of a user terminal 5 chose to the service condition presentation means 46, The class of service notified from the class-of-service expansion means 47 of the QoS server 4 was received, and it has a class-of-service setting-out means 14 to perform a network service by the class of service.

[0028] The node information gathering means 11 collects the network information for every network node 2 as node information, and sends this out to the network information gathering means 41 of the QoS server 4. Node information is the same information as the network information described previously, therefore is the toll of the allowances band information for every network node, congestion information, post-dialing delay information, and a traffic unit, network class-of-service information, etc.

[0029] The traffic measurement means 12 measures the amount of the communication link for which each of a user terminal 5 used the network service, i.e., communication link time amount, and the communication link amount of data, and sends this out to the traffic collection means 44 of the QoS server 4.

[0030] The service condition offer means 13 sends out the connection conditions which the user of a user terminal 5 chose to the service condition presentation means 46 while sending out the service conditions which the service condition presentation means 46 of the QoS server 4 presents to a user terminal 5.

[0031] The class-of-service setting-out means 14 receives the class of service notified from the class-of-service expansion means 47 of the QoS server 4, and performs a network service by the class of service.

[0032] Next, actuation of this operation gestalt is explained with reference to drawing 1, 2 and drawing 3, and 4 and 5.

[0033] In the network 3 of drawing 1 QoS client 1a in network node 2a, Each of QoS client 1b in network node 2b and QoS client 1c in network node 2c The node information on the self-network node 2, i.e., allowances band information on the self-network node 2, The toll of congestion information, post-dialing delay information, and a traffic unit, network class-of-service information, etc. are collected with the node information gathering means 11 of the QoS client 1, and this is sent out to the network information gathering means 41 of the QoS server 4. The network information gathering means 41 of the QoS server 4 collects the node information sent out from each QoS client 1, and manages it as network information. The network information which the QoS server 4 manages is as having been previously shown in drawing 3.

[0034] From the network information which the QoS server 4 of drawing 1 has managed, while the service unit rate means 42 sets up the toll for every service unit of a network service, the traffic unit rate means 43 sets up the toll of the traffic unit of a network service.

[0035] From user-terminal 5a of drawing 1, when it is going to use network services, such as an Internet connectivity of a network 3, a user makes connection with network node 2a first. QoS client 1a in network node 2a receives this connection with the service condition offer means 13, and notifies this connection to the service condition presentation means 46 of the QoS server 4. The service condition presentation means 46 returns the service conditions of a network service to the service condition offer means 13 of QoS client 1a, and the service condition offer means 13 notifies this service condition to user-terminal 5a. The service conditions notified to user-terminal 5a are the bandwidth at the time of using a network service, a post-dialing delay permissible dose, a toll, etc., for example, as shown on the screen of user-terminal 5a at drawing 5, they are displayed. Drawing 5 is drawing showing an example of the service condition offer screen displayed on a user terminal, 1. bandwidth needs what band, post-dialing delay permits 2. post-dialing delay permissible dose to what extent, or 3. toll shows whether the toll of a network service may be high, or the cheaper one is good.

[0036] A user chooses the service conditions for which self wishes from the service condition offer screen displayed on user-terminal 5a, and sends out to QoS client 1a as connection conditions. a user -- for example, -- the case where a thing with a toll "cheap although post-dialing delay does not care" is wished -- 1. bandwidth -- ** smallness and 2. post-dialing delay permissible dose -- ** size and 3. toll -- ** -- the case where what cheap ** is chosen, for example, "post-dialing delay is not generated for even if a toll is high" is wished -- 1. bandwidth -- ** size and 2. post-dialing delay permissible dose -- ** smallness and 3. toll -- ** -- high ** is chosen.

[0037] It is received by the service condition offer means 13 of QoS client 1a, and the selected connection conditions are sent to the service condition presentation means 46 of the QoS server 4, and are notified to the class-of-service expansion means 47. The class-of-service expansion means 47 sets up the quality of a network service as a class of service from the notified connection conditions, and it notifies it to the class-of-service setting-out means 14 of all the QoS clients 1a, 1b, and 1c that constitute a network 3 so that a network service may be performed in this class of service. Subsequent network services are performed according to the class of service notified to the class-of-service setting-out means 14.

[0038] The traffic measurement means 12 of QoS client 1a sends out the measured traffic to the traffic collection means 44 of the QoS server 4, when it is continuing measuring the traffic, i.e., communication link time amount and the communication link amount of data, and utilization of a network service is completed, while user-terminal 5a used the network service. The traffic collection means 44 notifies the traffic of user-terminal 5a which received to the accounting means 45, and the accounting means 45 performs accounting from the toll of the traffic unit which the service unit tariff and the traffic unit rate means 43 which the traffic and the service unit rate means 42 of user-terminal 5a set up set up to user-terminal 5a, and sends this out to accounting equipment 6. An example of accounting to a user terminal is as having been shown in drawing 4.

[0039]

[Effect of the Invention] As explained above, since a user can choose freely the service conditions of a network service to use at every connection and can specify them when connecting with a network from a user terminal, the network class-of-service setting-out method of this invention has the effectiveness of becoming possible to offer the network service according to the service condition.

[0040] Moreover, it has the effectiveness of becoming possible to collect the tariff according to the class of service according to the service conditions which a user uses, and the traffic to be used, i.e., the tariff which gave added value.

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